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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/507,175 | 09/10/2004 | Hiroji Aga | 121026 | 8967 |

25944 7590 04/25/2006

OLIFF & BERRIDGE, PLC
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EXAMINER

RODGERS, COLLEEN E

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2813

DATE MAILED: 04/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------|--------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/507,175 | AGA ET AL. | |
| | Examiner | Art Unit | |
| | Colleen E. Rodgers | 2813 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 September 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>9/10/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. Figures 2 and 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 8-11, 16-19, 24-27, 32-35 and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by **Ichikawa et al** (US Patent Application Publication 2006/0014330 A1).

Regarding claim 8, **Ichikawa et al** discloses a method of producing an SOI wafer in which an SOI layer is formed on a buried oxide film by forming an oxide film 54a on a surface of at least one of a bond wafer 52a and a base wafer 56a, bonding the bond wafer 52a to the base wafer 56a

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through the formed oxide film 54a [see Fig. 1, step (d)], and making the bond wafer 52a into a thin film [see Fig. 1, step (e)], wherein the total thickness of the oxide film forming on the surface of at least one of a bond wafer 52a and a base wafer 56a is thicker than the thickness of the buried oxide film formed thereby, the bond wafer 52a is bonded to the base wafer 56a through the formed oxide film 54a [see Fig. 1, step (d)], the bond wafer is made into a thin film to form an SOI layer [see Fig. 1, step (e)], and thereafter, an obtained bonded wafer is subjected to heat treatment to reduce a thickness of the buried oxide film [see paragraph 0052].

Regarding claim 9, **Ichikawa et al** discloses the method of claim 8 as described above, furthermore wherein the SOI layer formed is 250 nm in thickness [see paragraph 0057].

Regarding claims 10 and 11, **Ichikawa et al** discloses the method of claims 8 and 9, respectively, as described above, furthermore wherein a heat treatment is performed in an atmosphere of nitrogen, or preferably hydrogen or argon gas, at a temperature of 1200°C [see paragraph 0029].

Regarding claims 16-19, **Ichikawa et al** discloses the method of claims 8-11, respectively, as described above, furthermore wherein before the bond wafer is bonded to the base wafer, hydrogen ions or rare gas ions are implanted into a surface layer portion of the bond wafer to form an ion-implanted layer, and after the ion-implanted surface of the bond wafer is bonded to the base wafer, the bond wafer is delaminated at the formed ion-implanted layer to make the bond wafer into a thin film [see paragraph 0024].

Regarding claims 24-27 and 32-35, **Ichikawa et al** discloses the method of claims 8-11 and 16-19, respectively, as described above, furthermore wherein after the heat treatment is performed, sacrificial oxidation treatment is further performed [see paragraph 0052].

Regarding claim 40, **Ichikawa et al** discloses an SOI wafer produced according to the method of claim 8.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 12-15, 20-23, 28-31 and 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Ichikawa et al** (US Patent Application Publication 2006/0014330 A1).

Regarding claims 12-15, **Ichikawa et al** discloses the method of claims 8-11, respectively, as described above. **Ichikawa et al** does not specifically disclose that the thickness of the buried oxide film is reduced to 100 nm or less by the heat treatment.

However, these claims are *prima facie* obvious without a showing that the claimed ranges achieve unexpected results relative to the prior art range. *In re Woodruff*, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also *In re Huang*, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996) (claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also *In re Boesch*, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill of art) and *In re Aller*, 105 USPQ 233 (CCPA 1955) (selection of optimum ranges within prior art in general conditions is obvious).

In this case, there exists no evidence of record that the claimed heat treatment provides unexpected results in the thickness of the oxide layer produced. One of ordinary skill in the art would be motivated to optimize the thickness of the oxide layer to provide for device performance.

Regarding claims 20-23, **Ichikawa et al** discloses the method of claims 12-15, respectively, as described above, furthermore wherein before the bond wafer is bonded to the base wafer, hydrogen ions or rare gas ions are implanted into a surface layer portion of the bond wafer to form an ion-implanted layer, and after the ion-implanted surface of the bond wafer is bonded to the base wafer, the bond wafer is delaminated at the formed ion-implanted layer to make the bond wafer into a thin film [see paragraph 0024].

Regarding claims 28-31 and 36-39, **Ichikawa et al** discloses the method of claims 12-15 and 20-23, respectively, as described above, furthermore wherein after the heat treatment is performed, sacrificial oxidation treatment is further performed [see paragraph 0052].

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. **Moriceau et al** (USPN 6,974,759), **Park et al** (USPN 6,884,694), **Nakano et al** (US Patent Application Publication 2005/0032331), **Aulnette et al** (USPN 6,991,995), **Atanackovic** (USPN 7,018,484), **Kakizaki et al** (USPN 7,008,860), **Couillard et al** (US Patent Application Publication 2005/0266658), **Shaheen et al** (US Patent Application Publication 2005/0048738), **Sakurada et al** (US Patent Application Publication 2005/0064632), **Yokokawa et al** (USPN 6,566,233) and **Mitani et al** (US Patent Application Publication 2001/0016401).


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colleen E. Rodgers whose telephone number is (571) 272-8603. The examiner can normally be reached on Monday through Friday, 9:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CER


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